

WHAT IS CLAIMED IS:

1. An integrated circuit, comprising:
 - a number of pads;
 - a constant current source to provide a current;
 - a thermal diode that receives said current, said thermal diode being coupled between first and second ones of said pads;
 - an analog to digital converter to i) receive a forward bias voltage of the thermal diode, and ii) output a digital representation of the forward bias voltage.
2. The integrated circuit of claim 1, further comprising logic to receive the digital representation of the forward bias voltage and calculate a temperature of the integrated circuit.
3. The integrated circuit of claim 2, wherein said logic comprises a temperature look-up table.
4. The integrated circuit of claim 1, further comprising a register to store the digital representation of the forward bias voltage, said register being readable during normal operation of the integrated circuit.
5. The integrated circuit of claim 1, wherein a third one of said pads is provided to receive a reference current, said third pad being coupled to an

input of said constant current source, said reference current thereby serving to control the constant current source.

6. A method for measuring a temperature of an integrated circuit, comprising:

coupling first and second pads of the integrated circuit to a characterization device, said first and second pads being coupled to terminals of a thermal diode of the integrated circuit;

supplying a first current to the thermal diode, via the characterization device, to determine a saturation current of the thermal diode;

disconnecting the characterization device from the integrated circuit;

during normal operation of the integrated circuit, and on-board the integrated circuit, supplying a constant current to the thermal diode while converting a forward bias voltage of the thermal diode to a digital value; and

using said digital value in conjunction with a digital representation of said saturation current to calculate the temperature of the integrated circuit.

7. An integrated circuit, comprising:

a constant current source to provide first and second currents of different magnitudes;

first and second thermal diodes that respectively receive said first and second currents;

a comparator to receive forward bias voltages of each of the thermal

diodes, to compare the forward bias voltages, and to output a voltage difference indicative of a temperature of the integrated circuit.

8. The integrated circuit of claim 7, wherein the thermal diodes are positioned adjacent one another.

9. The integrated circuit of claim 7, wherein the first and second currents have a known relationship.

10. The integrated circuit of claim 7, wherein the second current is an integer multiple of the first current.

11. The integrated circuit of claim 7, wherein the comparator is a differential amplifier.

12. The integrated circuit of claim 11, further comprising an analog to digital converter to i) receive the voltage difference output by the differential amplifier, and ii) output a digital representation of the voltage difference.

13. The integrated circuit of claim 12, further comprising logic to receive the digital representation of the voltage difference and calculate a temperature of the integrated circuit.

14. The integrated circuit of claim 7, further comprising an analog to digital converter to i) receive the voltage difference output by the comparator, and ii) output a digital representation of the voltage difference.

15. The integrated circuit of claim 14, further comprising logic to receive the digital representation of the voltage difference and calculate a temperature of the integrated circuit.

16. The integrated circuit of claim 15, wherein said logic is configured in accordance with a known relationship between the first and second currents.

17. The integrated circuit of claim 15, wherein said logic comprises a temperature look-up table.

18. The integrated circuit of claim 15, further comprising one or more analog to digital converters to i) respectively receive said first and second currents, and ii) output digital representations of said first and second currents to said logic.

19. The integrated circuit of claim 14, further comprising a register to store the digital representation of the voltage difference, said register being readable during normal operation of the integrated circuit.

20. The integrated circuit of claim 7, further comprising a pad to receive a reference current, said pad being coupled to an input of said constant current source, said reference current thereby serving to control the constant current source.